

REMARKS

Claims 1-27 are the only claims currently active in this application. The foregoing separate sheets marked as “Listing of Claims” show all the claims in the application, each with an indication at its first line showing the claim’s current status.

I. Rejections Under 35 U.S.C. § 101

The Office Action rejects claims 19-27 as claiming subject matter that is non-statutory under 35 U.S.C. § 101. Office Action at p.2

Applicant respectfully submits, in response, the amended base claim 19, reciting (at lines 1-2): “a computer readable storage medium storing a computer program.” Applicant respectfully submits that claim 19, as amended, clarifies its claiming of statutory subject matter under 35 U.S.C. § 101. Applicant also submits dependent claims 20-27, each amended (at lines 1-3) to conform to claim 19, and to clarify their claiming of subject matter that is statutory under 35 U.S.C. § 101.

Applicant respectfully submits that the amendments are not new matter; all are supported at, for example, page 56, lines 12-24 of Applicant’s originally filed specification.

Applicant therefore respectfully requests the rejection under 35 U.S.C. § 101 be reconsidered and withdrawn.

II. Rejections Under 35 U.S.C. § 102

The Office Action rejects claims 1-3, 10-12 and 19-21 under 35 U.S.C. § 102(b) on the Examiner’s stated position that U.S. Patent No. 6,002,782 (“Dionysian”) anticipates each of these claims. Office Action at pp. 3-5.

Applicant traverses all of these rejections.

First, Dionysian lacks the claim 1, 10 and 19 limitation of: “generating ... [a] pose candidate as a candidate for pose of the object.”

Second, Dionysian lacks the claim 1, 10 and 19 limitation of: “generating [a] comparison image.”

The Examiner’s position is that Dionysian, at column 4, lines 29-58, discloses the “generating at least one pose candidate as a candidate for pose of the object.” Office Action at p. 3.

Applicant respectfully submits the Examiner’s position is not supported by the subject matter disclosed by Dionysian and/or is not consistent with the plain, broadest reasonable meaning of “candidate.”

Claims 1, 10 and 19 recite: “pose *candidate* for pose of the object.”

Applicant submits the claim term “candidate” is used consistently in Applicant’s specification, to mean a pose for evaluation to determine if it is the closest to the pose of the reference image, that this is the meaning that would be understood by a person of ordinary skill in the art. Further, the claims recite the “comparison image generating” as using the pose *candidate* to project the three-dimensional data of an object onto a two-dimensional surface, according to the pose candidate, and then compare the projection to the reference image to generate a comparison image close to the reference image. The comparison image is the pose, or rotation, of the three-dimensional object that is close to the pose or orientation of the reference object.

Applicant’s discloses examples within the plain meaning of the claimed “generating at least one pose candidate,” such as shown as item 20 at Figs. 1, 8, 10, 18 and 22, and as functional block 110 at Figs. 3, 4, 9, 12 and 20.

Turning to Dionysian, the portion cited by the Examiner (column 4, lines 29-58) describes transforming co-ordinate axes, i.e., rotating the “access image” of a person to the same orientation as the “model” image of the person that was previously stored. According to Dionysian the “model” image, and the orientation at which it was obtained, are stored and retrieved according to the person’s assigned personal identification number (PIN).

Reading Dionysian in its entirety, Dionysian discloses rotating the access image to align with the “model,” by first measuring the angle of rotation and then, based on that measurement, performing the co-ordinate transformation. Dionysian teaches performing the measurement by identifying features or contours, and then solving a system of equations. *See* Dionysian at Fig. 7.

Dionysian teaches *nothing* of generating a pose *candidate*.

For purposes of clarifying the claim 1, 10 and 19 “generating a pose candidate,” Applicant respectfully amends the claims to recite: “generating a *plurality of* pose candidates.” Applicant respectfully refers to the group of poses referenced as “pose candidate {ej}” throughout Applicant’s specification and drawings as example support for the claimed “plurality of pose candidates.”

Regarding the claim 1, 10 and 19 “generating at least one comparison image,” which Applicant has amended for form, the Examiner’s position is that Dionysian, at column 6, lines 5-27, discloses this generating. Office Action at p. 3.

Applicant respectfully submits that the Examiner’s position is not consistent with the Dionysian disclosure and/or with the language of the claims.

The claims recite projecting the three-dimensional data representing the object onto a two-dimensional plane in accordance with the pose candidate, and then comparing the projection to the reference image. This element does not identify if the object matches the reference object; it generates the comparison image for other claim elements to compare to the reference image. The comparison image is the projection of the object that has a pose, *i.e.*, an orientation, closest to the pose or orientation of the reference object.

For purposes of removing issues and expediting advancement of the application, Applicant has amended claims 1, 10 and 19 to recite generating the comparison image as performing a projection of the three-dimensional image data for each of the pose candidates, to generate a plurality of comparison images, and then selecting the projection having the smallest minimum distance as the comparison image close to the reference image. *See* claim 1, currently amended, at lines 12-20; claim 10, currently amended, at lines 12-16; and claim 19, currently amended, at lines 12-17.

Applicant respectfully refers the Examiner to Applicant's Fig. 3 at functional blocks 120, 130 and 140 as example support for these claim amendments.

Applicant's claim 1, 10 and 19 invention has not measured the orientation of the object when performing the projection of the three-dimensional data onto the two-dimensional, plane according to the pose candidates. Applicant's claim 1, 10 and 19 invention, instead, estimates the orientation (or "pose") by performing a plurality of projections of the three-dimensional image data onto a two-dimension plane, and then selecting the projection having the minimum distance to the reference image. This projection is the comparison image close to the reference image.

Dionysian at column 6, lines 5-27 discloses projecting the access image onto a two-dimensional plane, *based on the measured orientation* of the access image that Dionysian obtained by its Fig. 7 system of equations. Dionysian then compares the projection to a projection of the model image to determine a match.

Applicant respectfully submits that the operations disclosed by Dionysian at column 6, lines 5-27 are not within the broadest reasonable meaning of the recitations at claim 1, currently amended, at lines 12-20; or at claim 10, currently amended, at lines 12-16; or at claim 19, currently amended, at lines 12-17.

Applicant, for the foregoing reasons, respectfully urges the Examiner to reconsider and withdraw the rejection of base claims 1, 10 and 19.

Dionysian cannot anticipate dependent claims 2-3, 11-12 and 20-21, for at least the reasons that Applicant submits above in response to the rejection of base claims 1, 10 and 19.

III. Rejections Asserted Under 35 U.S.C. § 102

The Office Action rejects dependent claims 4, 7-9, 13, 16-18 and 25-27 under 35 U.S.C. § 103(a), on the stated position these claims are obvious over Dionysian in view of U.S. Patent Publication No. 2001/0020946 (“Kawakami”). Office Action at pp. 5-10

The Office Action rejects dependent claims 5-6, 14-15 and 23-24 under 35 U.S.C. § 103(a), on the stated position these claims are obvious over Dionysian in view of Kawakami, further in view of U.S. Patent No. 6,956,569 (“Roy”). Office Action at pp. 10-12.

Applicant respectfully traverses all of these rejections.

Applicant submits, first, that all of the claims rejected under 35 U.S.C. § 103 depend from respective base claims 1, 10 and 19.

Applicant’s base claims 1, 10 and 19 recite: storing or providing a reference image; inputting a three-dimensional data of an object; generating a plurality of candidate poses; projecting the three-dimensional data onto a two-dimensional plane based on the plurality of candidate poses to generate a plurality of comparison images, and selecting the comparison image having the smallest minimum distance to the reference image as the comparison image close to that reference; and then comparing the generated comparison to the reference image to determine if a match exists.

As Applicant submits at section II of this paper, reading Dionysian in its entirety shows it discloses: storing a model image and the model’s orientation; measuring the orientation of an access image; rotating the access

image to the same orientation as the stored model image, based on the measuring; and comparing the rotated access image to the stored model.

Applicant respectfully submits, as Applicant submits at section II above, that reading Dionysian in its entirety and comparing it to claims 1, 10 and 19, shows it lacks the claim 1, 10 and 19 generating a plurality of candidate poses, and it lacks the claim 1, 10 and 19 generating a comparison image close to the reference image.

Applicant respectfully submits that the combined teachings of Kawakami and Roy do not cure the deficiencies of Dionysian with respect to Applicant's base claims 1, 10 and 19.

Stated with greater specificity, the Examiner cites Kawakami as a teaching of a correction coefficient. Applicant respectfully submits that Kawakami is not cited as teaching of, and discloses nothing within the meaning of the claim 1, 10 and 19 generating a plurality of candidate poses, and nothing within the meaning of the claim 1, 10 and 19 generating a comparison image close to the reference image.

Further, the Examiner cites Roy as a teaching of a weighting coefficient. Applicant respectfully submits that Roy is not cited as a teaching of, and discloses nothing within the meaning of the claim 1, 10 and 19 generating a plurality of candidate poses, and nothing within the meaning of the claim 1, 10 and 19 generating a comparison image close to the reference image.

Applicant respectfully urges, for at least the reasons above, that the Examiner reconsider and withdraw the rejection of dependent claims 5-9, 13-18 and 23-27.

Conclusion

In view of the foregoing, Applicant respectfully requests that the application be reconsidered, that claims 1-27 be allowed, and that the application be passed to issue.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

Please charge any fees necessary for entry of this amendment, and credit any overpayment of fees to Attorney's Deposit Account No. 50-2041 (Whitham, Curtis, Christofferson & Cook P.C.).

Respectfully submitted,



Michael E. Whitham

Reg. No. 32,635

Whitham, Curtis, Christofferson & Cook, P.C.
11491 Sunset Hills Road, Suite 340
Reston, VA, 20190
Phone: 703-787-9400
Fax: 703-787-7557